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(71) Applicant: **HTM SPORT S.p.A.**
I-16035 Rapallo (Genova) (IT)

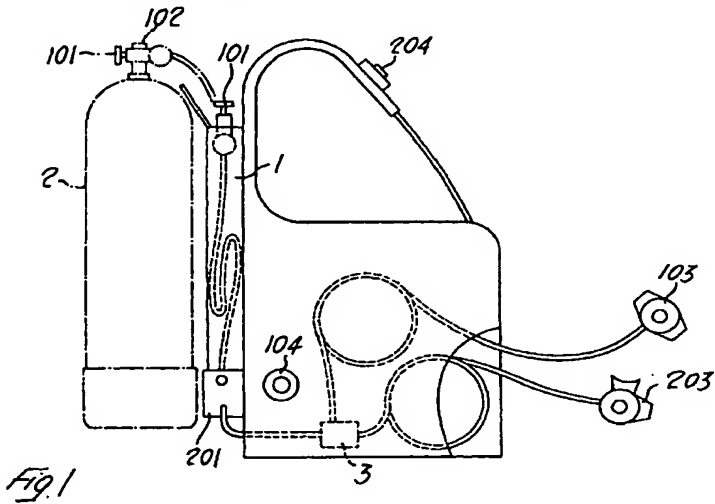
(72) Inventors:
• **Garofalo, Giovanni**
16035 Rapallo (Genova) (IT)
• **Belloni, Alberto**
16036 Recco (Genova) (IT)
• **Canella, Gabriele**
16035 Rapallo (Genova) (IT)

(74) Representative:
Porsia, Attilio, Dr.
c/o Succ. Ing. Fischetti & Weber
Via Caffaro 3/2
16124 Genova (IT)

(54) **Equipped balancing waistcoat**

(57) Equipped balancing waistcoat. It includes a stiff back (1) containing a first stage reducer (101), an high and low pressure distributor (201) and connecting whips; from said distributor start whips for different func-

tions (103, 203, 4, 5). The waistcoat moreover includes pneumatic exhaust valves (104, 204), a manual emergency control (6) and a mouth inflation device (106).



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Description

[0001] The present invention refers to a balancing waistcoat for divers.

[0002] Divers who love to dive for long times are constrained to carry, besides the bottles, a series of whips or pipes connecting the bottles to the different functions: supplier, emergency supplier, and so on. All these whips can cause some nuisances and difficulties to the user since they can get entangled with some obstacles or with each other, so compromising their functionality and the users safety. These and other problems, such as, for instance, the recharge and the quick exhaust of the balancing waistcoat air are solved by the present invention.

[0003] In fact, the balancing waistcoat according to the invention is equipped for containing all the whips within, moreover it includes upper and lower pneumatic exhaust valves. The waistcoat back consist of a container in which, according to an operative form of the present invention, are inserted the whips coming from the first reduction stage connected to the bottle and a first high and low pressure distributor. According to a second operative form of the invention, in said container is inserted the first reduction stage connected with a first high and low pressure distributor, being the bottle connected with the first stage by a simple window. From the distributor the whips enter the balancing waistcoat and go towards: the pressure gauge or the check computer, the control system and the second distributor. From these system start the connections to the functions: from the control system to the balancing waistcoat and the watertight wetsuit, from the second distributor to the second stage and the emergency supplier.

[0004] By using an equipped balancing waistcoat according to the invention, the connection between the bottle and the first stage reducer and/or the first distributor is protected by the back from eventual wrong positioning or tears, the diver has all the controls and functions within reach without having "roaming" whips, easily sets his position in the water thanks to the exhaust valves which allow him to take any position he wants, moreover, thanks to the computer, he can check for instance the air pressure in the bottles, at which depth he is and many others data.

[0005] The invention will be now better described with reference to the enclosed drawings, where:

- Figure 1 is a side elevation view of an operative form of the equipped balancing waistcoat according to the present invention;
- Figure 2 is a first operative form of air circulation system in schematic form;
- Figure 3 is a side elevation view of the waistcoat of figure 1, and
- Figure 4 is a second operative form of air circulation system in schematic form.

[0006] The balancing waistcoat of figure 1 consist of a stiff back 1 and a part of textile material similar to the waistcoat on the market. In the upper part of the back 1 is the first stage reducer 101 connected with the valve 102 of the bottle 2. In the lower part of the back 1 is the first distributor 201, which is an high (HP) and low (LP) pressure distributor. The waistcoat includes a second distributor 3 directing the air to the second stage 103 or the second emergency stage 203. On the waistcoat it can be seen the lower 104 and upper 204 exhaust valves. In the diagram of figure 2 it can be noticed that the first distributor 201 is connected also with a control system 4 provided with charge 304 and exhaust 404 push-button and with a pressure gauge or a computer 5 by an high pressure line.

[0007] In Figure 3 it can be seen the second stage 103, the second emergency stage 203, the control system 4, the computer 5 coming out of the balancing waistcoat. On the waistcoat shoulder it can be seen: the upper exhaust pneumatic valve 204, the emergency manual control 6 and the mouth inflation 106, moreover there is the plug 7.

[0008] In Figure 4 is described an operative form alternative to the one described in figure 2. To like numbers correspond like parts. According to this operative form, the first stage 401 is housed in the waistcoat back container, and is connected to the bottles by a whip ending up at the bracket 301. The first stage 401 is connected with a distributor including one or more low pressure exits and at least one high pressure exit.

[0009] Later on is described the functioning of the whip connecting system between bottle and user, made by means of the back, according to the invention.

[0010] In the first execution form of Figures 1 to 3, the air coming out of the bottle valve 102 goes into the first stage 101, one part goes out at low pressure (LP), one part passes isobarically (HP). The two whips, by passing within the back 1, reach the first distributor 201.

[0011] The high pressure air directly goes to the computer pressure detector or to the pressure gauge. On the basis of the measured data the computer shows the amount of air still present in the bottles, the duration time and other data.

[0012] One part of the low pressure air passes through the second distributor 3, from which start the whips to the second stage 103, it is to say to the user's supplier and to the second emergency stage 203, also said Octopus. There can eventually not be the second distributor 3, in this case, evidently, the second stage 103 and the Octopus 203 are directly connected with the first distributor, as shown in Figure 3.

[0013] The other part of low pressure air goes to the control system 4.

[0014] The control system 4 allow, in case of need, to fill the balancing waistcoat with air by pressing the push-button 304. Eventually, if the push-button 404 is present, it is possible to exhaust the air from the waistcoat; in this case the valves pneumatic opening system can be of

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the type described in the European Patent Application No. 98121298.8, filed November 9, 1998 belonging to the same applicant Company.

[0015] The second execution form shown in figure 4 is different from the first one, since the balancing waistcoat includes the first stage 401 too, connected with an high pressure distributor, connected to the bottles by means of a whip and the connecting bracket 301. The air coming out from the distributor connected with the high pressure first stage goes towards the computer 5 or the pressure gauge, the air coming out from the low pressure first stage reducer goes towards the second distributor 3 and from here towards the reduction second stage 103 and the Octopus 203 or towards the control system 4. As shown, analogously to the executive form of Figure 2, the control system 4 is also connected with the waistcoat exhaust valves. Moreover it can be provided for the high pressure air to be sent directly from the bottle or bottles to the computer pressure detector or to the pressure gauge.

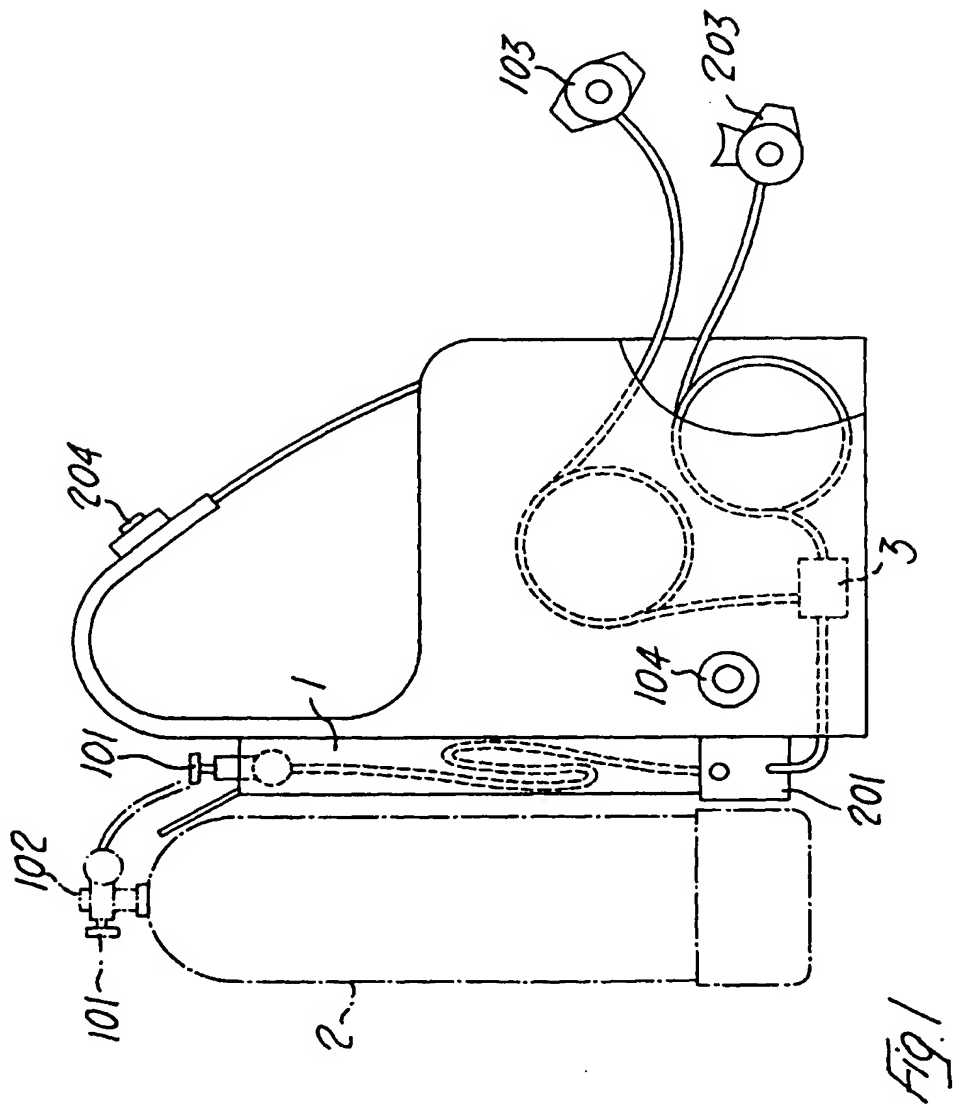
[0016] In case the user wears a watertight wetsuit, the control system 3 or 4 can be connected to the wetsuit too, so regulating the filling.

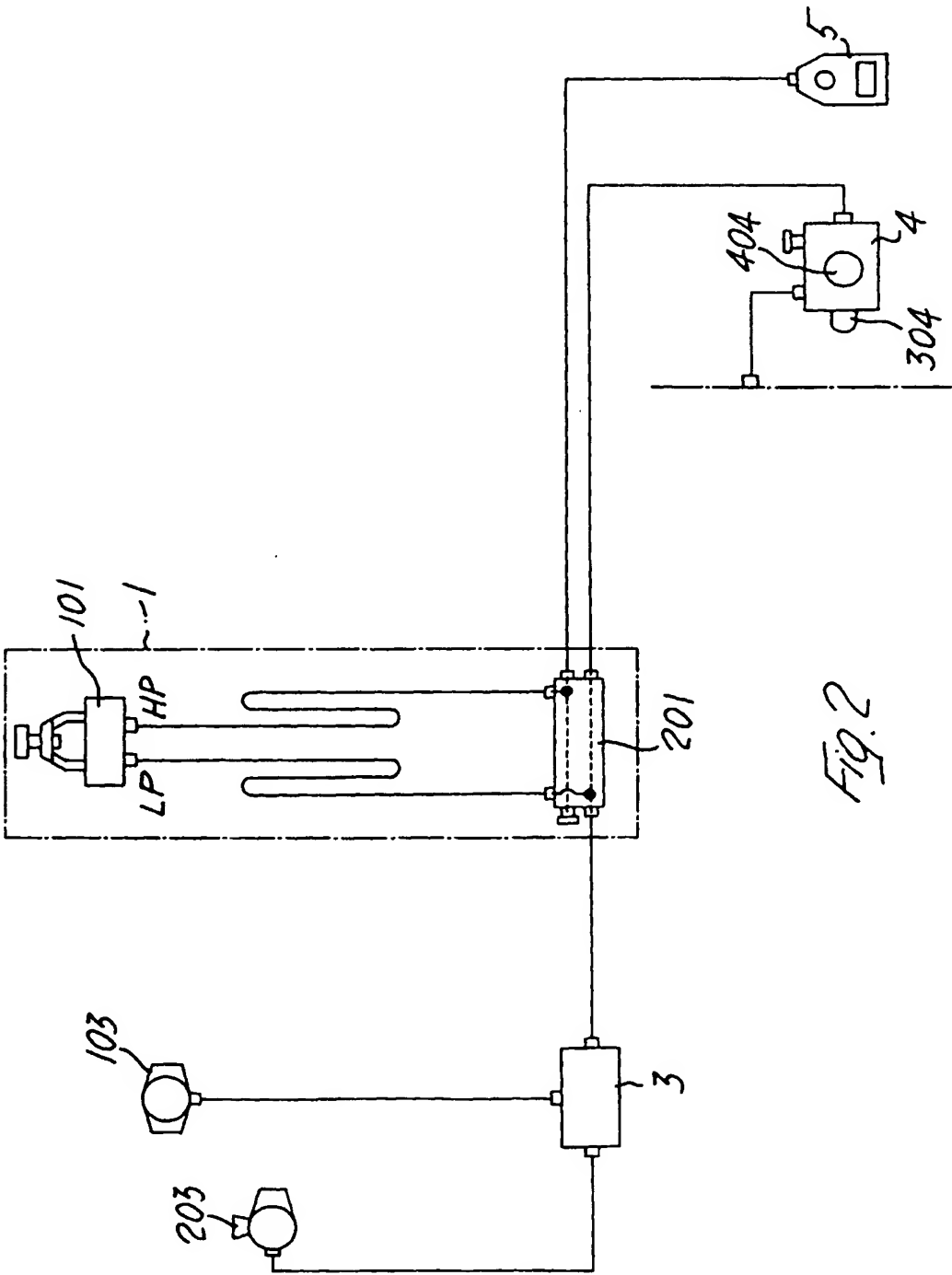
[0017] The push-button 6 allow to manually control the balancing waistcoat in emergency cases. The pipe 106 is an element for manual or mouth waistcoat inflation.

6. A balancing waistcoat according to claims 1, 2 and 3, characterised in that a second distributor (3), set in the balancing waistcoat, is upstream of the second stage (103) and the second emergency stage (203).

Claims

1. An equipped balancing waistcoat characterised in that it includes a stiff back (1) housing a first stage reducer (101, 401), an high and low pressure distributor (201) and whips for the connection between the reducer and/or the distributor and the compressed-air bottle or bottles; from said distributor (201) start whips for different functions (103, 203, 4, 5), and in that the waistcoat includes also pneumatic exhaust valves (104, 204), an emergency manual control (6) and a mouth inflation element (106).
2. A waistcoat according to claim 1, where said first stage reducer and said distributor are united in an only body.
3. A balancing waistcoat according to claim 1, characterised in that the whips coming out of the first distributor (201, 401) pass within the waistcoat to the functions (103, 203, 4, 5).
4. A balancing waistcoat according to claims 1 and 2 characterised in that the control system (4) controls the balancing waistcoat inflation.
5. A balancing waistcoat according to claim 3, characterised in that the control system (4) controls the exhaust valves (104, 204).





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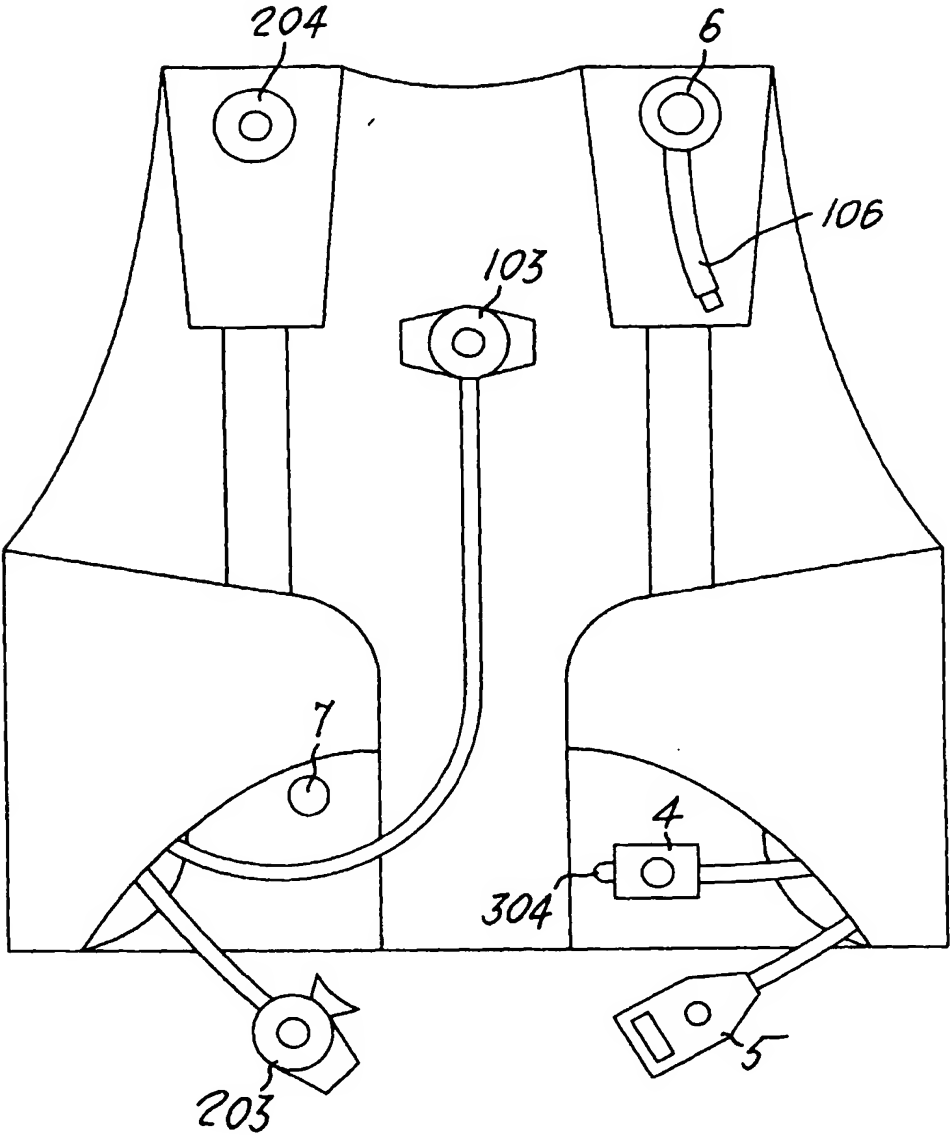


Fig. 3

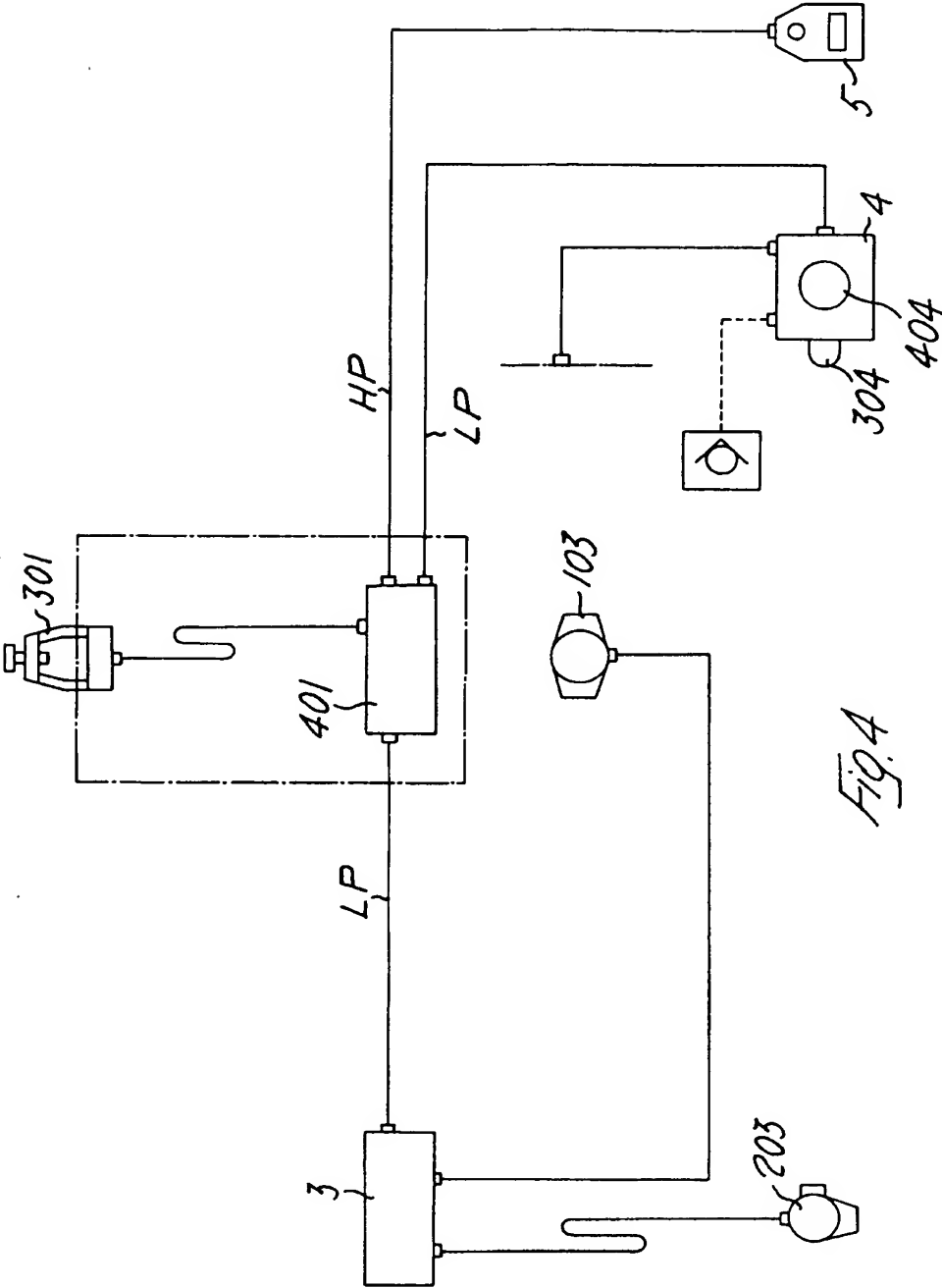


Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 99 10 3097

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 July 1999	Examiner Häusler, F.U.
CATEGORY OF CITED DOCUMENTS			
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The present search report has been drawn up for all claims			
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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